

SUSTAINABLE FRAMEWORK MODEL (SUSTIA FWM) FOR TRAFFIC IMPACT ASSESSMENT IN MALAYSIA

¹Sharifah Awang

¹Nurmunira Muhammad

²A. Zulkiple

¹N.W. Kamaruzaman

¹M. A Seman

¹N.A. Zamri

¹N. Rahman

¹M.R Siti Norsita

¹Postgraduate Student, Faculty of Civil Engineering, Universiti Malaysia Pahang, Malaysia

²Senior Lecturer, Faculty of Technology, Universiti Malaysia Pahang, Malaysia

¹sharifahawang08@gmail.com

¹aira.munira@gmail.com

²adnanz@ump.edu.my

ABSTRACT

Transportation plays vital role in our daily mobilization and more than 30% of our income is consumed to meet its needs and Government of Malaysia had spent more than RM 100 billion for the provision of transportation infrastructure and facilities. The proposed study emphasized on integrating existing database with homemade transportation analysis system that had been developed based on green technology approach called SusTIA-FWM. Bottlenecks in traffic impact assessment studies such as data collection and simulation were tackled since data and the results of the previous study stored in the caretaker system were recycled. A SMART Partnership study with Kuantan Municipal Council was done successfully and this framework model was recognized, so for the next study only limited data were collected to facilitate data redundancy and dependency on imported software will not being a decisive factor of a reliable traffic study anymore.

1.0 INTRODUCTION

In the past 20 years, Government of Malaysia had spent more than RM 100 billion to study, design, construct and maintain transportation infrastructure and facilities. For any transportation projects at least 2 % of the budget is allocated for the conduct of the feasibility and viability studies which are the key to the implementation of any projects. Thus, there is a market worth of RM 100 million per year allocated for traffic and transportation consulting business. The proposed sustainable traffic and transport consulting services can viably tap at least RM 1,000,000 a year from the conventional traffic and transportation consulting services. Traffic impact assessment (TIA) is essential elements during the planning and design stage that the developer needs to comply in order to obtain the approval of the authority on the proposed traffic mitigation and management measures as to counter the impact of the proposed development with the prevailing transportation system. Quoted from NDoT (1995),

TIA was defined as “*A procedure to determine the effect that a change in land use or transportation infrastructure may have on existing and future traffic conditions*” [1]. TIA is currently included as one of the compulsory elements for a successful conduct of project environmental impact assessment (EIA). TIA will measure traffic condition before (without project) and after (with project) the completion of the proposed development [2].

1.1 Need for a Better Traffic Consulting Services

Sustainable transportation system for a town can be achieved by a coordinated effort of the stakeholders, namely the local authority (the municipality), project developers, practicing traffic consultants and the public at large. However, the main problems those being faced in Malaysian transportation system at present are:

- i. The authorities have poor coordinating control in the provision of a sustainable transportation system since they do not have a screening system to impose the requirement for project developers to provide essential transportation facilities
- ii. The developers do not subscribe to long term transportation facilities upgrading programs as they do not see the ‘big picture’ i.e. advantages of sustainable transportation system to their sales
- iii. The traffic consultants are not uniformly subscribed to a standard practice since they do not have the media for database exchange
- iv. The public is not well informed about the public transportation status and plans which to extend can influence their decision to choose public transportation.

In the long run, the whole country will benefit from the provision of a sustainable transportation system that will allow for the exploration of the miss opportunities if the current traffic consulting practices prolonged as status quo.

Thus, the objectives of the study were set to be as follows:

1. To screen probable IT solutions that can trouble shoot the bottleneck
2. To develop the so called sustainable traffic consulting services based on SusTIA-FWM approach

2.0 LITERATURE REVIEW

The issues relating to traffic accidents and road congestion were not new and in Malaysia, billions of Ringgit has been spent over the last few decades to continually address these problems and the situation keeps worsening each day. Upon taking office as Prime Minister in 2002, Tun Abdullah Badawi former Prime Minister had personally chaired a national committee to curb the ever rising traffic accidents in the country [3]. His aim was to have zero road traffic accidents. By the time he ended his term and a new Prime Minister is appointed, this noble aim is far from reachable as the total nationwide traffic accidents continue to increase as the local roads management measures were undermined. For records, traffic accidents on the local roads especially motorcycle contributed more than 50% of the total traffic accidents in the country [4].

Moreover, worldwide studies suggested that traffic safety problems are best to be intercepted at the root level and this can be achieved through well-coordinated traffic impact consultancy practices. It was well known that Malaysian transformed from an agriculture economy to an industrialized economy through the support of reliable road and highway network system. However, traffic congestion problem is retarding the rate of national industrialization as the desired mobility level is not achieved particularly for peak hour work travel due to extremely high demand for private vehicles as compared to that for the public transportation modes. As a consequence, higher usage for public transportation system can be achieved by upgrading of the public transport facilities and wider coverage of public transportation. According to Botha (2005), TIA current process was lack of reviewing by the authorities, meanwhile the process should be simplified and clearly defined [5]. All of these are the elements of a sustainable traffic impact assessment practice as implemented in Japan. All of these were the elements of a sustainable traffic impact assessment practice as implemented in developed nations as shown in Figure 1.

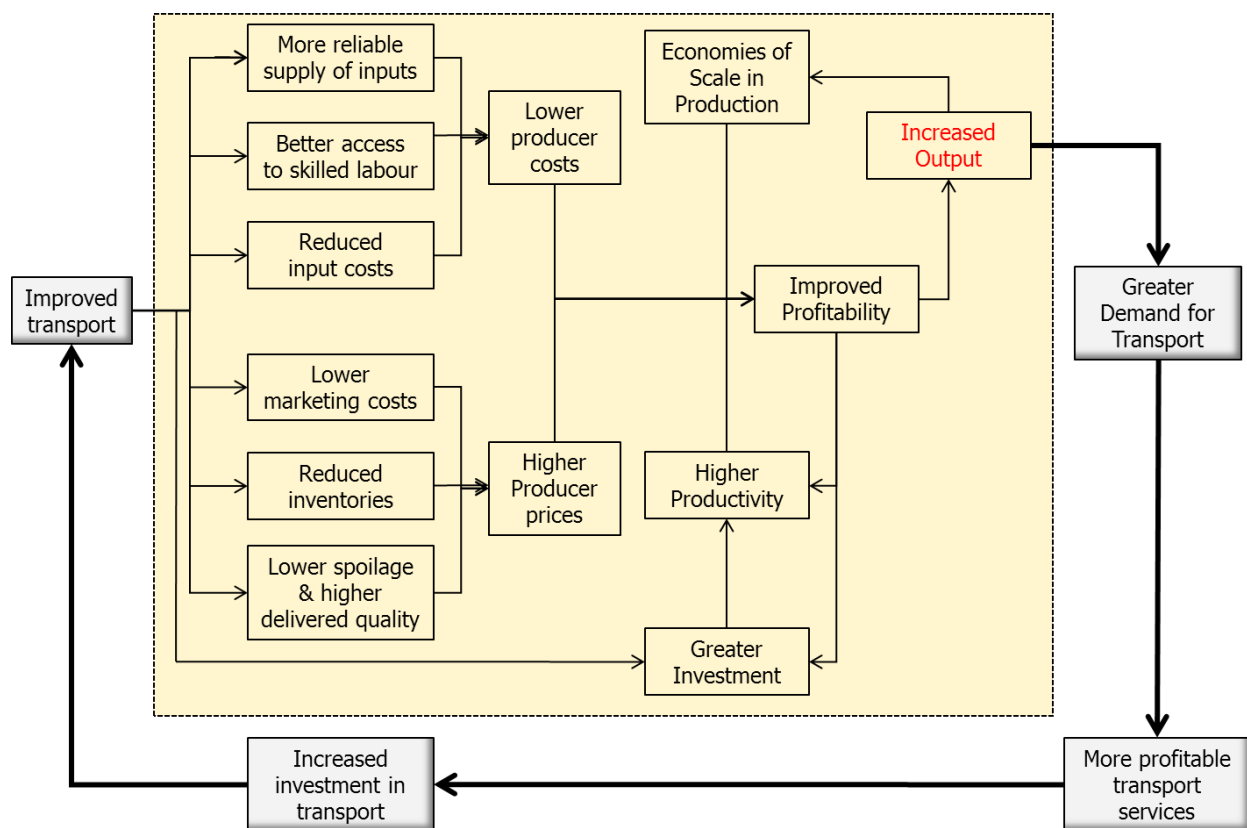


Figure 1: Relationship between transport and economic development

3.0 RESEARCH METHODOLOGY

The engineer must have clear view on the existing traffic condition to perform TIA because TIA required more information such as trip generation as well as information on surrounding streets and land use. Site impact analysis includes assessment of trip-generation characteristics, which depend on current and projected land use, trip distribution and modal split [6]. The proposed sustainable traffic impact assessment practices would integrate existing database with a homemade transportation analysis system based on local constraints. It tackled bottleneck like data collection, simulation and analysis, which were readily produced and stored during the system development. In the nutshell it would provide corrective action (modification) to the current practice in transportation consulting services which was data intensive and too much dependent on foreign (imported) software or system as shown in Figure 2. Meanwhile, the project key features were presented as illustrated in Figure 3. The standard process as mention in Site Impact Handbook [7] was simplified and improved.



Figure 2: Technology Architecture

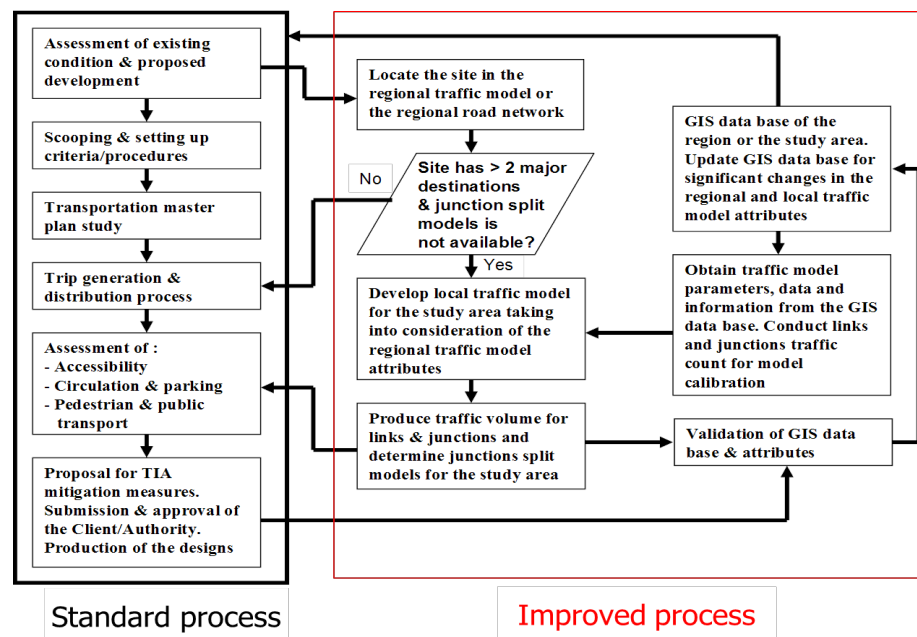


Figure 3: Technology Architecture of upgrading standard process to improve the process

4.0 DISCUSSION

As noticed, there were numbers of well-established traffic and consultant firms in the country (both domestic and international) that tend to have right of first refusal given by developers and the authorities. But, with the existent of SusTIA FWM which is free consultancy service (pay for reimbursable only) for the proposed online traffic and transportation database system has found to be more friendly user and safe cost. In case other firms are being appointed to conduct the study, SusTIA FWM consultant can still ensure the sustainability of the services by supplying the essential data from database (at nominal fees). Having the data handy will save the firms valuable time and cost. The process is when the firms received the appointed job, SusTIA FWM will supply the raw data and they will gives us back with the output. So, instead of having competitors, it may bring a win-win situation in Malaysian market.

5.0 FINDINGS

During this study, based on SusTIA FWM we developed a web portal as a database collection and a platform for sharing information as illustrated in Figure 4 to screen probable IT solutions that can trouble shoot the bottleneck. This website applied the technology architecture discussed earlier.

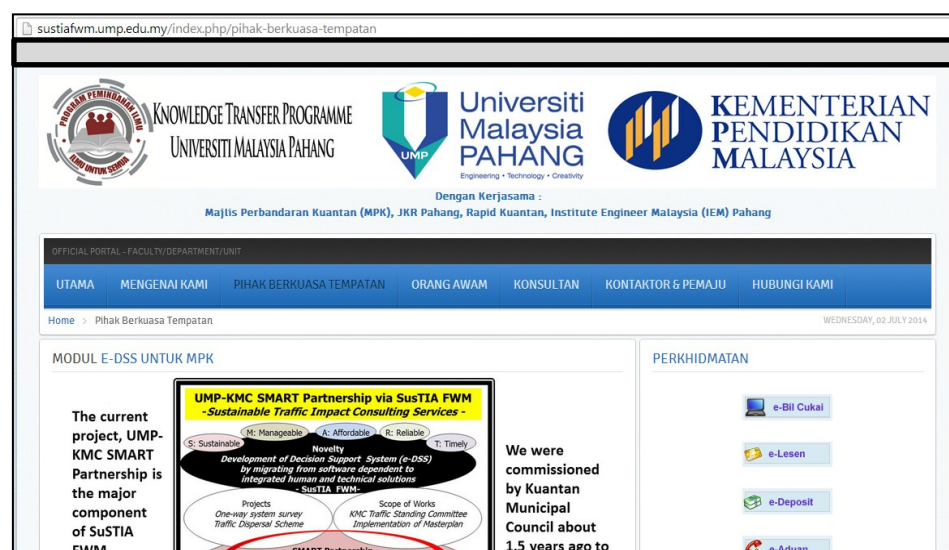


Figure 4: Web Portal for sustainable framework model

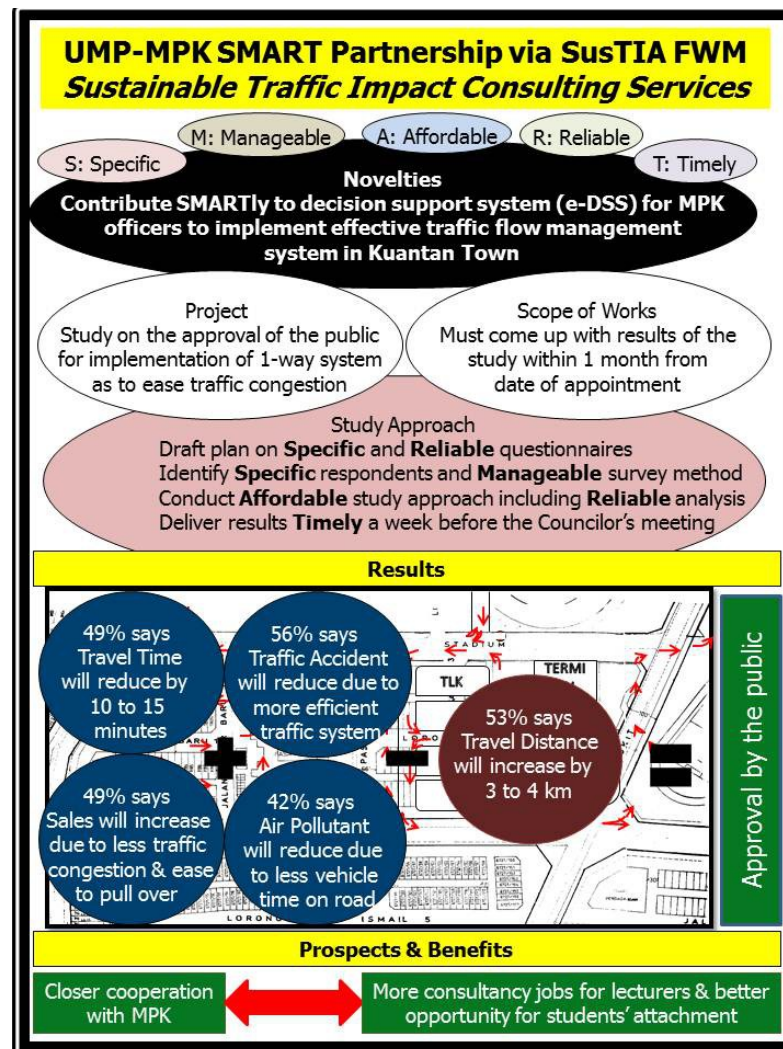
Major findings from the study were summarized as follows:

1. Product A - Decision support system for the authorities. The local authority can guide the councillors to make decision on issues related to the necessity and the scope of a traffic impact assessment projects.
2. Product B - Painting the 'big picture' for the project developers. Traffic impact scenario generated for various projects will provide developers the hints on the impact of their proposed project to the transportation system.

3. Product C - Database exchange media for the traffic consultants. This web portal will provide traffic engineers and planners with communication tools that can conveniently use to retrieve and digest existing data and information.
4. Product D - Public transportation information. The public will be exposed to the existing and future public transportation system for travelling and private vehicle ownership decision

Meanwhile, in achieving the second objective of this study to develop sustainable traffic consulting services based on SusTIA FWM approach, a study was done with Kuantan Municipal Council as illustrated in Figure 5 below. This UMP-MPK SMART partnership via SusTIA FWM approached was approved by Kuantan Municipal Council and been being conducted successfully.

Figure 5:
MPK SMART
partnership via
FWM



UMP-
SusTIA

6.0

CONCLUSION

The main that can be here is, the FWM is a framework that can time and while give online and

ideas conclude SusTIA TIA design save cost better traffic

transportation database system. With the existence of web portal and SMART Partnership approach, SusTIA FWM may tackle the issues on traffic accidents and traffic congestion better than traditional approach. With this improvement process, traffic engineer and researcher can perform TIA using the updated data which are more accurate and suitable with the current environment.

7.0 REFERENCES

- [1] NDoT. (1995). Manual for traffic impact studies. Department of Transport South Africa. Research Report RR93/635.
- [2] Minnesota Department of Transportation. (2008). Mn/DOT Access Management Manual.
- [3] Abdullah, A. B. (2006). Ninth Malaysia Plan 2006-2010.
- [4] Manan, M. M., and Varhelyi, A. (2012). Motorcycle fatalities in Malaysia. IATSS Research, pp. 30–39.
- [5] Botha, J. L. (2005). Trends in the traffic impact assessment process. Proceeding of the 24th southern African Transport Conference (SATC 2005).
- [6] Kurtz, M. (2004). Handbook of transportation Engineering.
- [7] Florida Department of transportation. (1997). Site Impact Handbook. Florida.